AMENDMENTS TO THE SPECIFICATION:

Amend the paragraph added to page 40, after line 16, by the Amendment filed October 18, 2002, to read as follows:

Brief Description of the Drawings

Figure 1 shows a schematic of the laser measurement setup.

Figure 2 shows an embodiment of the fabrication of a single-frequency 1.32-1.4 um laser in Nd-doped phosphate glass fused to La-doped glass.

Figure 3 shows an optical device in the form of a laser according to an embodiment of the invention. The laser is pumped in the direction of arrows (1), has a high reflector (2), a substrate (3) of longitudinal length, L_c, with multiple longitudinally running waveguides (4) which differ in latitudinal width and, thus, give have differing effective refractive indices resulting in different outputs (λ_1 to λ_4) and a DBR grating (5) with a pitch, Λ, and longitudinal length, L_g.

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. **(Currently Amended)** An optical device comprising:

a glass substrate doped with a laser species, and ~~having~~

two or more waveguides defined ~~by~~ as channels ~~in~~ running longitudinally within the substrate wherein the channels are doped with a laser species, have ~~having~~ a distinct refractive index from the substrate and ~~wherein~~ at least two of the waveguides are defined by channels having differing latitudinal widths such that they have different effective refractive indices from each other.

2. **(Original)** An optical device of claim 1, wherein the substrate is comprised of an alkali phosphate glass doped with Er and Yb.

3. **(Original)** An optical device of claim 2, wherein the waveguides are comprised of an alkali phosphate glass doped with Er and Yb, which has been treated so that the refractive index is higher than that of the substrate.

4. **(Original)** An optical device of claim 3, wherein the optical device is prepared by applying a mask to the substrate glass having apertures of a width and length corresponding to the waveguides to be formed in the substrate and conducting ion-exchange by contact with an ion-exchange solvent to form the waveguides through the apertures.

5. (Original) An optical device of claim 3, wherein the optical device is prepared by applying a mask to the substrate glass having apertures of a width and length corresponding to the waveguides to be formed in the substrate and conducting photolithography to form the waveguides through the apertures.

6. (Previously Presented) An optical device of claim 1, which further comprises a reflecting element in association with and at the end of the waveguide to provide a laser effect when pumped.

7. (Original) The optical device of claim 6, wherein the reflecting element is a diffraction grating provided on the substrate.

8. - 15. (Canceled)

16. (Currently Amended) ~~A laser amplifier which comprises an~~ An optical device of claim 1 in the form of a laser amplifier, ~~as a waveguide~~ further comprising:

a laser light source in pumping communication with the two or more waveguides and

one or more mirrors or reflection gratings located along the length of the waveguides which provides feedback to create a laser-resonator cavity, provided that one or more of the mirrors or reflection gratings is partially reflective for providing laser output.

17. (Canceled)

18. **(Currently Amended)** The optical device of claim 1, wherein the ~~glass substrate is doped with a~~ laser species is selected from the group consisting of the rare-earth elements Er, Yb, Nd, Ho, Tm, Sm, Tb, Dy, Pr and combinations thereof.

19. - 21. **(Canceled)**

22. **(Previously Presented)** The optical device of claim 1, wherein the device is in the form of a multi-wavelength laser source which further comprises at least one pump light source coupled through a suitable launch-end mirror by butting against the end of a waveguide.

23. **(Previously Presented)** The optical device of claim 22, which comprises eight pump laser diodes as pump light sources, eight corresponding sets of waveguides and eight optic fibers held by an alignment block such that each respective fiber is optically coupled to the emitting end of the top or first waveguide of each set of waveguides.

24. **(Previously Presented)** The optical device of claim 1, in the form of a multi-wavelength laser source having multiple sets of waveguides, a corresponding pump light source for each set of waveguides and with output fibers connected to the middle waveguide of each set of waveguides.

25. **(Previously Presented)** The optical device of claim 24, wherein each pump light source is coupled through a lens to concentrate the light from the pump light source into a waveguide.

26. (Previously Presented) The optical device of claim 1, in the form of a single-wavelength laser source having multiple waveguides and a single pump light source capable of being coupled to any of the waveguides such that at least two of the waveguides provide outputs of differing wavelength when pumped.

27. (Previously Presented) The optical device of claim 1, in the form of a laser which comprises redundant waveguides all operating at a single wavelength and further comprises at least one DBR mirror as a reflecting element in association with at least one waveguide on the substrate.

28. (Previously Presented) The optical device of claim 1, in the form of a laser comprising at least two waveguides and at least two corresponding DBR mirrors each being tuned to a unique wavelength.

29. (Previously Presented) The optical device of claim 1, in the form of a laser wherein the device includes a hermetic package, is pumped by an optical fiber, and is coupled to an output optical fiber such that it is capable of taking a noisy pump light input and outputting a clean laser output light at a different frequency.

30. (Previously Presented) The optical device of claim 1, in the form of an integrated device that further comprises a pump laser diode, a light-sensing diode, a thermistor and electrical connections between and to these components.

31. (Previously Presented) The optical device of claim 1, in the form of a laser having direct butt coupling of a pump laser diode to a waveguide.

32. (Previously Presented) The optical device of claim 1, in the form of a laser having lensed coupling of a pump laser diode to a waveguide.

33. - 36. (Canceled)

37. (New) An optical device of claim 1, further comprising at least one passive doped region of a substrate having at least one waveguide therein.

38. (New) An optical device of claim 37, wherein the passive doped region is doped with lanthanum.

39. (New) An optical device of claim 37, wherein the passive doped region contains a DBR grating.

40. (New) A method for preparing an optical device having at least one active doped region substrate, at least one passive doped region substrate and at least one waveguide defined therein which comprises:

contacting a surface of a separate active doped substrate and a surface of a separate passive doped substrate with each other,

heating the contacting substrates at a temperature above the softening temperature of the substrates so that they fuse together, and

providing at least one waveguide channel in the substrates before or after they are contacted, heated and fused.

41. **(New)** An optical device comprising at least one active doped region substrate, at least one passive doped region substrate and at least one waveguide defined therein which is prepared by the process of claim 40.

42. **(New)** An optical device of claim 41, wherein at least one active doped region of the substrate is comprised of an alkali phosphate glass doped with Er and Yb.

43. **(New)** An optical device of claim 41, in the form of a laser further comprising:

a laser light source in pumping communication with the two or more waveguides and

one or more mirrors or reflection gratings located along the length of at least one waveguide which provides feedback to create a laser-resonator cavity, provided that one or more of the mirrors or reflection gratings is partially reflective for providing laser output.

44. **(New)** An optical device of claim 41, wherein at least one active doped region is doped with at least one rare earth element.

45. **(New)** An optical device of claim 41, which is in the form of a single-frequency 1.32-1.4 um laser wherein the active doped region is a Nd-doped phosphate glass and the passive doped region is a La-doped glass passive region, the passive region having a DBR grating with a period which reflects a single wavelength in the range of 1.32–1.4 um.

46. **(New)** The optical device of claim 41, in the form of a laser which further comprises a hermetic package, an optical fiber laser pump in communication with at least one waveguide, and an optical fiber output coupled to at least one waveguide, wherein the device is capable of taking a noisy pump light input and outputting a clean laser output light at a different frequency.

47. **(New)** The optical device of claim 41, in the form of an integrated device that further comprises a pump laser diode, a light-sensing diode, a thermistor and electrical connections between and to these components.

48. **(New)** The optical device of claim 41, in the form of a laser further comprising a pump laser diode with direct butt coupling to at least one waveguide.

49. **(New)** The optical device of claim 41, in the form of a laser further comprising a pump laser diode with lensed coupling to at least one waveguide.

50. **(New)** A method comprising:

providing a glass substrate doped with a laser species which has one or more waveguides defined as channels within the substrate which channels have a distinct refractive index from the substrate, the channels also being doped with a laser species, and

heating the substrate containing one or more waveguides to modify the wavelength of the one or more waveguides in a finely tuned way whereby the heating expands the glass to increase the wavelength but the extent of increase in wavelength is lessened by the heating also decreasing the refractive index of the glass forming the one or more waveguides.

51. **(New)** The method of claim 50, wherein the substrate has two or more waveguides defined as channels running longitudinally within the substrate and at least two of the waveguides have differing latitudinal widths such that they have different effective refractive indices from each other

52. **(New)** The method of claim 50, wherein the modifying of the wavelength in a finely tuned way upon heating occurs at a rate which is about 15 times less than that observed for DFB lasers.

53. **(New)** The method of claim 50, wherein the change in wavelength per degree centigrade temperature change upon heating is less than 0.02 nm/°C.

54. **(New)** The method of claim 50, wherein the substrate comprises an alkali phosphate glass doped with Er and Yb.